CLAIMS

What is claimed is:

1. A deinterlacing apparatus comprising:

a field buffer which receives and stores a plurality of consecutive interlaced fields, and then outputs, in response to a control signal, p-th interlaced line data of an m-th field, p-th interlaced line data of an (m+2)-th field, p-th interlaced line data of an (m+1)-th field, and (p+1)-th interlaced line data of the (m+1)-th field in series or the p-th interlaced line data of the (m+1)-th field, p-th interlaced line data of an (m+3)-th field, the p-th interlaced line data of the (m+2)-th field, and (p+1)-th interlaced line data of the (m+2)-th field in series;

a shift buffer which receives signals output from the field buffer in series, converts the signals into parallel signals, and outputs first through fourth line data in parallel;

a frame generator which receives the first through fourth line data from the shift buffer, senses motion between fields of the first through fourth line data between fields, and selectively outputs, as an output signal, a first result of temporally filtering adjacent line data or a second result of spatially filtering adjacent line data in response to the result of the motion sensing; and

a line exchanger which receives the first line data of the shift buffer and the output signal of the frame generator and selectively exchanges the first line data with line data of the output signal of the frame generator in response to a line exchange signal,

wherein the first line data are comprised of line data of the (m+1)-th field and line data of the (m+2)-th field which are repeatedly output.

2. The deinterlacing apparatus of claim 1, wherein the frame generator comprises:

a motion sensor which senses motion in the line data between fields based on the p-th interlaced line data of the m-th field and the p-th interlaced line data of the (m+2)-th field or motion in the p-th interlaced line data of the (m+1)-th field and the p-th

line data of the (m+3)-th field and outputs, as an output signal, the result of the motion sensing;

a temporal filter which receives the p-th interlaced line data of the m-th field and the p-th interlaced line data of the (m+2)-th field or the p-th interlaced line data of the (m+1)-th field and the p-th interlaced line data of the (m+3)-th field and outputs an average of the p-th interlaced line data of the m-th field and the p-th interlaced line data of the (m+2)-th field or an average of the p-th interlaced line data of the (m+1)-th field and the p-th interlaced line data of the (m+3)-th field;

a spatial filter which receives the p-th and (p+1)-th interlaced line data of the (m+1)-th field and outputs their average, or receives the p-th and (p+1)-th interlaced line data of the (m+2)-th field and outputs their average; and

a selector which selectively outputs the output signal of the temporal filter or the output signal of the spatial filter in response to the output signal of the motion sensor.

3. The deinterlacing apparatus of claim 1, wherein the line exchanger exchanges every odd-numbered or even-numbered line data of the first line data output signal with their corresponding line data of the output signal of the frame generator and then outputs the results of the exchange.

4. The deinterlacing apparatus of claim 1, wherein the first data output signal is comprised of line data of the (m+1)-th field and line data of the (m+2)-th field which are alternately output.

5. A deinterlacing apparatus comprising:

a first storing unit which receives an input signal and buffers the input signal on a field basis;

a second storing unit which includes first through fourth sub-memories receiving four line data, respectively, from an m-th field, an (m+1)-th field, an (m+2)-field, and an (m+3)-th field, respectively, stored in the first storing unit and sequentially storing the first through fourth line data;

a frame generator which senses motion in the first line data and the third line data stored in the second storing unit, performs temporal or spatial filtering on the first through fourth line data in response to the result of the motion sensing, and outputs the result of the temporal or spatial filtering; and

a line exchanger which receives an output signal of the first sub-memory and an output signal of the frame generator, exchanges line data of the output signal of the first sub-memory with line data of the output signal of the frame generator in response to a predetermined line exchange signal, and simultaneously outputs two deinterlaced frames,

wherein line data of the (m+1)-th field and line data of the (m+2)-th field are sequentially stored in the first sub-memory.

6. The deinterlacing apparatus of claim 5, wherein the frame generator comprises:

a motion sensor which senses motion in the line data between the m-th field and the (m+2)-th field or between the (m+1)-th field and the (m+3)-th field, based on an output signal of the first sub-memory and an output signal of the third sub-memory, and outputs the result of the motion sensing;

a temporal filter which receives and temporally filters the output signals of the first and third sub-memories, and outputs the result of the temporal filtering;

a spatial filter which receives and spatially filters the output signals of the second sub-memory and the fourth sub-memory, and outputs the result of the spatial filtering; and

a selector which receives an output signal of the temporal filter and an output signal of the spatial filter and selectively outputs one of the output signal of the temporal filter and the output signal of the spatial filter in response to an output signal of the motion sensor.

7. The deinterlacing apparatus of claim 5, wherein the line exchanger exchanges every odd-numbered or even-numbered line data of the first line data output

signal with their corresponding line data of the output signal of the frame generator and then outputs the results of the exchange.

8. A deinterlacing method comprising:

(a) receiving and storing a plurality of consecutive interlaced fields, and then outputting, in response to a control signal, p-th interlaced line data of an m-th field, p-th interlaced line data of an (m+2)-th field, p-th interlaced line data of an (m+1)-th field, and (p+1)-th interlaced line data of the (m+1)-th field in series or the p-th interlaced line data of the (m+1)-th field, p-th interlaced line data of an (m+3)-th field, the p-th interlaced line data of the (m+2)-th field, and (p+1)-th interlaced line data of the (m+2)-th field in series;

(b) receiving signals output in step (a) in series, converting the signals into parallel signals, and outputting first through fourth line data in parallel;

(c) receiving the first through fourth line data output in step (b), sensing motion between fields in the first through fourth line data, and selectively outputting, as an output signal, a result of temporally filtering adjacent line data or a result of spatially filtering adjacent line data in response to the result of the motion sensing; and

(d) receiving the first line data and a signal output in step (c) and selectively exchanging the first line data with line data of the signal output in step (c) in response to a predetermined line exchange signal,

wherein the first line data are comprised of line data of the (m+1)-th field and line data of the (m+2)-th field which are repeatedly output, and in step (d), every odd-numbered or even-numbered line data of the first line data output signal are exchanged with their corresponding line data of the signal output in step (c) and then the results of the exchange are output.

9. The deinterlacing method of claim 8, wherein step (c) comprises:

(c1) sensing motion in the p-th interlaced line data of the m-th field and the p-th interlaced line data of the (m+2)-th field or motion in the p-th interlaced line data of the (m+1)-th field and the p-th line data of the (m+3)-th field and outputting the result of the motion sensing;

(c2) receiving the p-th interlaced line data of the m-th field and the p-th interlaced line data of the (m+2)-th field or the p-th interlaced line data of the (m+1)-th field and the p-th interlaced line data of the (m+3)-th field and outputting an average of the p-th interlaced line data of the m-th field and the p-th interlaced line data of the (m+2)-th field or an average of the p-th interlaced line data of the (m+1)-th field and the p-th interlaced line data of the (m+3)-th field;

(c3) receiving the p-th and (p+1)-th interlaced line data of the (m+1)-th field and outputting their average, or receiving the p-th and (p+1)-th interlaced line data of the (m+2)-th field and outputting their average; and

(c4) selectively outputting a signal output in step (c2) or a signal output in step (c3) in response to the result of the motion sensing.